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Predictors of Quality of Life in Patients with Cutaneous T cell Lymphoma

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by

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DEDICATION

I dedicate this to my parents, Wayne and Charlotte Deaver, who taught me that tenacity and perseverance opens many doors of opportunity. To my siblings, Stephanie, Christopher, and Michelle, who have provided unrelenting support in my pursuit of higher education. To Jessica Bremm, your amazing patience and fabulous support have saved me thousands of dollars in therapy. Thank you! Also, a heartfelt "thank you" to Chris who showed me that being a "smarty pants" is great, but that there is plenty of fun in life that would be sadly missed if I continued to live my life in the library.

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Abstract

Cutaneous T cell lymphoma (CTCL) is a rare, incurable, chronic disease accounting for approximately 3% of non-Hodgkin's lymphoma diagnoses every year. Patients with CTCL have skin lesions that can vary in severity putting patients at risk for developing symptoms that may impair their quality of life (QOL). The disease burden can lead to increased depressive symptoms, fatigue distress, and anxiety that the disease may be worsening. Seventy-five participants agreed to take part in an exploratory, prospective study to evaluate depressive symptoms, anxiety, fatigue distress, and spirituality as predictors of QOL in CTCL patients. Demographic variables including stage of disease, ethnicity, age, gender, marital status, level of education, and time since diagnosis, were also included in the analyses to assess for relationships. Bivariate correlations, t-tests, and regression analyses were conducted to assess for relationships among the predictor variables and QOL. The analyses revealed that the proposed model explained 64% of the variance, and depressive symptoms ($t= -2.4$, $p= 0.020$) and stage of disease ($t= -3.0$, $p= 0.004$) significantly predicted the QOL of CTCL patients. Evaluating for predictors that influence the QOL helps us to better understand the needs of the patients afflicted with CTCL. The importance of studying the QOL of the CTCL patients lies in the fact that nurses can assist in helping patients alleviate some of the symptoms they experience, thereby improving their QOL. Further study is warranted in developing interventions to assist in the preservation of QOL.

Chapter I: Introduction

Cutaneous T cell lymphoma (CTCL) is a malignancy characterized by the presence of a clonal T lymphocyte population in the skin and affects the largest, most visible organ that we possess, the skin. CTCL may initially present with patch or plaque lesions on the skin, which tends to resemble psoriatic lesions. In the United States, approximately 16,000 to 20,000 people are currently living with a diagnosis of CTCL. In addition, approximately 1200 new cases of this disease are diagnosed each year (Demierre, Gan, Jones, & Miller, 2006; Sampogna, et al, 2009). Like psoriasis, CTCL is chronic, indolent in nature, and has complex pathophysiology involving the manifestations of a dysfunctional immune system primarily affecting the skin (Kimball, Jacobson, Weiss, Vreeland, & Wu, 2005; Pereira, Brito, & Smith, 2011). This disease causes itchy, painful, flakey, and erythematous skin that can significantly impact the quality of life in affected patients. It has also been known to have a higher incidence in men than women and is typically diagnosed in older patients (Kim & Hoppe, 1999). Patients with a diagnosis of CTCL are part of a small population that suffers from a chronic, incurable disease.

Clinical manifestations may imitate indolent, non-malignant conditions; therefore, obtaining a biopsy is important in confirming the diagnosis of CTCL. The specimen undergoes morphologic and immunohistochemical evaluation. The observed infiltrate consists of both CD4 positive (+) and CD8 positive (+) T cells, more specifically clonal CD4+ CD45RO positive (+) skin homing cells (Demierre et al, 2006; Wong, Mishra, Hake, & Porcu, 2011). The diagnosis of CTCL is further supported by an increased ratio of CD4+ to CD8+ T cells, TCR clonality, and loss of surface antigens such as clusters of differentiation 5 (CD5), CD7, and CD26. Morphological features such as exocytosis, epidermotropism, and Pautrier's microabscess may

also be present (Wong et al, 2011). Microscopic and immunophenotypic evaluation of Pautrier's microabscess demonstrate that they are intraepidermal collections of malignant T lymphocytes that are in close proximity to dendritic cells also known as Langerhan's cells. From this information came the hypothesis that cytokines released from the Langerhan's cells recruit malignant CD4+ cells to the epidermis. This cross talk may also be important for disease progression (Wong et al, 2011).

Histopathology reveals infiltration of reactive CD8+ and malignant CD4+ T cells, with a dominance of T helper cell type 1 (TH1) cytokine patterns in early stages, with a gradual shift to the predominance of CD4+ T cells and T helper cell type 2 (TH2) skewing in advanced stages of CTCL (Wong et al, 2011). This suggests that the loss of CD8+ mediated immune response may parallel the progression of disease.

Staging of disease is imperative for determining treatment and prognosis. Complete physical examination to assess the percentage of body surface area that is involved is imperative. Recommendations also include laboratory studies, viral studies to include Epstein-Barr Virus (EBV) and cytomegalovirus (CMV) by Polymerase Chain Reaction (PCR), hepatitis panel, Human Immunodeficiency Virus (HIV) 1 & 2, and human T lymphocyte virus (HTLV) 1 & 2. Positive Emission Topography (PET) and Computed Topography (CT) scans upon initial evaluation will show the presence or absence of lymphadenopathy and/ or organomegaly and should be obtained. Bone marrow biopsy should be performed if systemic disease is suspected (NCCN, 2012). Staging has been presented by the National Comprehensive Cancer Network (Tables 1 & 2).

Table 1.

TNMB		TNMB Classification and staging of Cutaneous T Cell Lymphoma
Skin		
	T1	Limited patches, papules and/or plaques covering <10% BSA
	T2	Patches, papules and/or plaques covering >10% BSA
	T3	One or more tumors (>1 cm in diameter)
	T4	Confluence of erythema >80% BSA
Node		
	N0	No clinically abnormal peripheral lymph nodes; biopsy not required
	N1	Clinically abnormal peripheral lymph nodes; histopathology Dutch grade 1
	N2	Clinically abnormal peripheral lymph nodes; histopathology Dutch grade 2
	N3	Clinically abnormal peripheral lymph nodes; histopathology Dutch or 3-4
	NX	Clinically abnormal peripheral lymph nodes; no histologic confirmation
Visceral		
	M0	No visceral organ involvement
	M1	Visceral involvement(must have pathology confirmation and organ should be specified)
Blood		
	B0	Absence of significant blood involvement: <5% of peripheral blood lymphocytes are atypical (Sezary) cells.
	B1	Low blood tumor burden: >5% of peripheral blood lymphocytes are atypical (Sezary) cells but does not meet the criteria of B2
	B2	High blood tumor burden: >1000mcl Sezary cell

Table 2. Staging for Cutaneous T-cell Lymphoma.

	T	N	M	B
IA	1	0	0	0, 1
IB	2	0	0	0, 1
IIA	1-2	1, 2	0	0, 1
IIB	3	0-2	0	0, 1
IIIA	4	0-2	0	0
IIIB	4	0-2	0	1
IVA	1-4	0-2	0	2
IVA	1-4	3	0	0-2
IVB	1-4	0-3	1	0-2

Cytokine profiles performed on lesional skin from patients representing all stages of disease have provided clues to the changes in the microenvironment during progression of CTCL (Wong et al, 2011). Normal to increased expression of interleukin-2 (IL-2), interleukin-12 (IL-12), and interferon gamma (IFNG), a normal T helper cell type 1 (TH1) cytokine pattern, is observed in early stage CTCL. Decreased IL-2, IL-12, and IFNG demonstrate a loss of TH 1 cytokines and an increase in interleukin-4 (IL-4), interleukin-10 (IL-10), interleukin-5 (IL-5), and interleukin-13 (IL-13) demonstrates an increase in T helper cell type 2 (TH 2) cytokines and is seen in late stages of CTCL. Interleukin-5 has been associated with the recruitment of eosinophils and may play a role in the development of pruritis. A pleotropic cytokine, interleukin-16 (IL-16), has recently been identified as a chemoattractant for CD4+ T cells. The gradual loss of intracellular IL-16 in T cells is observed from CTCL stage IB and on. The CD8+

T cells share a TH 1 phenotype and play a role in cell-mediated immunity; their presence may be consistent with an anti-tumor response (Wong et al, 2011).

Apart from the detrimental physiological manifestations, numerous psychosocial consequences prevail given the disfiguring nature of CTCL; including negative self-image and altered perception of self by others (Sampogna et al, 2009). While few studies have focused on CTCL, there have been studies on psoriasis, a similarly disfiguring disease. Studies have demonstrated that approximately 40% experience significant anxiety, 38% experience high levels of worry, 10% of patients with psoriasis experience clinical depression, and 10% experience suicidal ideation (Gupta, Schork, Gupta, & Ellis, 1993; Gupta, Gupta, Schork, & Ellis, 1994; Fortune, Richards, Main, & Griffiths, 2000; Richards, Fortune, Griffiths, & Main, 2001). The impact of a disfiguring disease, such as psoriasis, on quality of life has been described as similar to other chronic diseases, to include cancer, arthritis, and depression (Rapp, Feldman, Exum, Fleischer, & Reboussin, 1999).

There have been limited studies assessing the quality of life in CTCL patients. Two studies have examined the psychological and social issues in CTCL patients using the Health Related Quality of Life (HRQoL) instrument and the SkinDex-29 measurement tool (Sampogna et al, 2009; Demierre, et al, 2006). Together, these studies established that patients suffer significant emotional distress related to the visibility of the disease, painful, itching skin, and worry about the prognosis of the cancer diagnosis. CTCL is an incurable disease that has a profound effect on patients' lives about which we know little. This disease can be devastating and the impact on quality of life is as important as the outcome of treatment (Djulbegovic, 1997). CTCL can be a disfiguring disease with significant consequences affecting the psychological and emotional status of the patients, as well as their ability to form or maintain interpersonal relationships. Social rejection, fear of contagion, or avoiding touch is a situation

that a person with a chronic skin condition may encounter (Sampogna et al, 2009). In addition, distorted body image may lead to altered self-perception and dysfunctional intimate relationships (Sampogna et al, 2009). These issues have not been explored in CTCL patients.

Treatment of CTCL is determined based on the stage of disease at initial presentation. Skin directed therapies are the treatment of choice in patients with stage IA to IIA disease (Huber, Staib, Pehamberger, & Scarfetter-Kochanek, 2006; Gardner, Evans, Musiek, Rook, & Kim, 2009). These therapies may include topical corticosteroids, topical retinoids (e.g. Bexarotene), phototherapy or any combination of these options. In patients with stage IA disease that is refractory to topical treatment or progresses on skin directed therapy, the addition of a systemic treatment may increase the response rate (Huber et al, 2006). Patients initially diagnosed with stage IIB or higher disease will be treated with more aggressive, systemic treatment with or without skin directed therapy (Gardner, Evans, Musiek, Rook, & Kim, 2009). Systemic treatment can come in the form of oral biologic modifiers, immunotherapy, intravenous chemotherapy, or intravenous biologic therapy. Once patients have achieved a response, identified by a decrease in the amount and visibility of cutaneous lesions, tapering the treatment regimen or providing maintenance therapy is essential in optimizing duration of response (Prince, Whittaker, & Hoppe, 2009).

If they achieve good control of their disease, patients with CTCL may live as long as their normal age matched controls (Demierre et al, 2006). Improving their quality of life may profoundly impact the patient's ability to cope with the diagnosis of an incurable disease and encourage patients to take an active part in managing the symptoms of their disease. Assessing the predictors of quality of life in patients with CTCL will form a solid foundation for future intervention studies to improve the control of the symptoms they experience.

Statement of the problem

Patients with CTCL may experience profound emotional and physical pain related to their disease, about which little is known. The areas of affected skin can become significantly pruritic and painful. In some cases these manifestations can involve greater than 80% of the body surface area. Little research has focused on the quality of life in patients with CTCL although it is known to be an incurable, chronic disease. Understanding the predictors of QOL might lead to better management of disease symptoms, thus improving the quality of life.

Study of purpose

The purpose of this study was to evaluate predictors of quality of life of patients with CTCL. Information gathered from surveys evaluating depressive symptoms, anxiety, spiritual well-being, fatigue distress, and the frequency and severity of cutaneous issues may be beneficial in evaluating the psychosocial and physical consequences of CTCL and how it influences quality of life. The information will also be the foundation on which to design future intervention studies and guide clinical practice.

Specific Aims

The specific aims of this descriptive, exploratory, prospective study are to:

1. Examine the factors that may predict the quality of life of patients with CTCL.
2. To evaluate the psychosocial burden (depressive symptoms, anxiety, spiritual well-being, and fatigue distress) of CTCL.
3. Examine the influence of depressive symptoms, anxiety, fatigue distress, time since diagnosis, spiritual well-being, selected demographic variables including age and gender on the quality of life in patients with CTCL.

4. To correlate the data obtained from the Skindex-29 and the Skindex-16 to evaluate the relationship between the two instruments and identify the most appropriate measurement tool for the given population.

Definition of Relevant Terms

Depressive Symptoms: The impairment of the ability to appreciate the pleasures of life. Feeling sad or "down in the dumps", easy to cry even at the smallest issues, everything appears bleak and hopeless, or a person feels that he or she will never be normal again (DSM IV, 2004).

Spiritual well-being: A feeling of contentment and peace that arises from relationships with self, others, and a higher power, such as god. (Burkhardt, 1989).

Fatigue: "a distressing persistent, subjective sense of tiredness or exhaustion related to cancer or cancer treatment that is not proportional to recent activity and interferes with usual functioning" (NCCN, 2012).

Fatigue Distress: distress or bother caused by fatigue or tiredness (Holley, 2000).

Anxiety: A natural response and a necessary warning adaptation in human beings that can become a pathologic disorder when excessive. It may, or may not, have a specific external stimulus, and can manifest physical and affective symptoms as well as changes in behavior and cognition. (DSM-IV, 2004).

Quality of Life: A complex concept that may be affected by an individual's level of independence, psychological state, environment, social relationships, and physical health. (WHOQOL Group, 1993b).

Significance to Nursing

Care of the patient with Cutaneous T cell lymphoma focuses on management of distressing symptoms including, but not limited to, pruritis, pain, fatigue, and insomnia (Sampogna et al, 2009). As the disease progresses, symptoms become more severe and more

prevalent. The primary goal is to alleviate suffering and achieve optimal symptom management for patients experiencing this rare disease. Evaluating for predictors of quality of life in patients with cutaneous T cell lymphoma will provide insight into what symptoms are the most distressing and have the most impact on quality of life for these patients. Identifying the most distressing symptoms will allow us to focus future interventions on improving management of those symptoms, thereby improving the quality of life for our patients.

Chapter II: Review of the Literature

This chapter reviews and synthesizes the current literature of cutaneous T cell lymphoma. A search was conducted utilizing MEDLINE, PubMed, PSYCHinfo, and CINAHL to explore the literature regarding the quality of life in patients with CTCL. Keywords such as, "quality of life", "Cutaneous T cell lymphoma", "psoriasis", "depression", and "body image" were used to guide the search. All years and all designs were included. Manual searches of references were conducted to identify pertinent studies to include in the literature review.

Peer reviewed articles were assessed for scientific rigor and relevance to the current study. The theoretical framework is discussed followed by a synthesis of the current knowledge about depressive symptoms and the role of each variable in the development of depressive symptoms. Finally, the knowledge gaps where additional research is needed are identified.

Theoretical Framework

Maintaining good quality of life is important for patients with CTCL as their disease can cause unsightly skin manifestations, pain and itching, which in turn, can cause alterations in body image (Sampogna et al, 2009; Demierre et al, 2006). The symptoms of the disease can also alter the maintenance and/or development of interpersonal relationships (Sampogna et al, 2009). The concepts represented in the model, provide a foundation for enhancing the quality of life for patients with an incurable, chronic disease.

The conceptual model used in guiding this study (Figure 1) represents the suggested influence that demographic data such as age, gender, and ethnicity have on quality of life. The

model also represents how psychological symptoms such as depression, spiritual well-being, fatigue, and anxiety and physical symptoms of the disease are related to the quality of life.

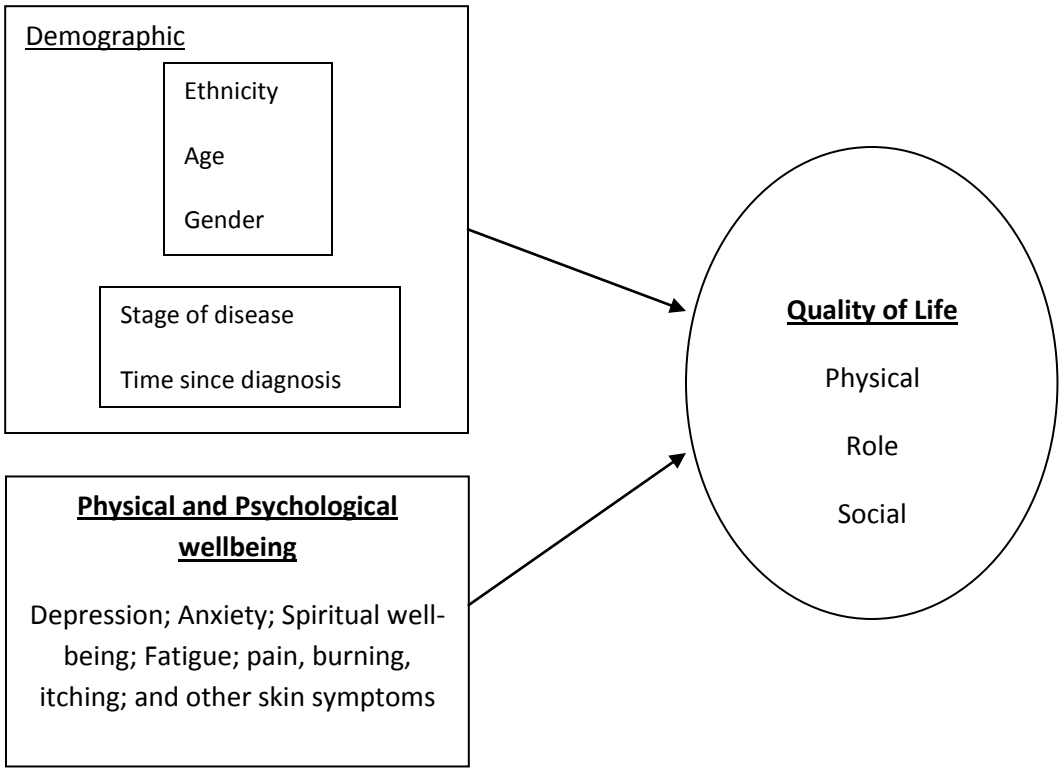

Figure 1. Conceptual Model for the Study

Psoriasis

Psoriasis, also considered a disfiguring skin disease, negatively affects quality of life in CTCL patients. Many cases of CTCL will present with lesions resembling psoriasis that may result in misdiagnosis until there is a lack of response to treatment or a progression of disease. Perrott and colleagues (2000) conducted an observational study to evaluate the relationships among physician ratings of physical severity, participant self-ratings of quality of life, and feelings of stigmatization in 101 patients with psoriasis (Perrott, Murray, Lowe, & Mathieson,

2000). The psoriasis area and severity index (PASI) was rated by a dermatologist working in the clinic and three questionnaires were administered to patients receiving psoralen and ultraviolet (PUVA) light therapy for their psoriasis. The participants responded to seven pairs of questions to assess the overall quality of life. These questions addressed the level of distress, disruption to daily routine, disruption to social life, general impact of psoriasis, and perceptions of others noticing the disease. Participants also completed a 33-item stigmatization scale and answered questions related to vignettes designed to assess perceptions of prejudice, upset, discrimination, and embarrassment facing the participant. Participants whose disease manifested at a younger age expressed more feelings of stigmatization as compared to older patients with comparable disease severity. On the contrary, older participants reported greater psychosocial impact, as they perceived more negative impact in how they were viewed by others but did not feel stigmatized (Perrott et al, 2000).

Approximately two-thirds of patients with psoriasis report the disease has a negative impact on their everyday life and this approaches 80% in patients with severe disease (Weiss, Kimball, & Liewehr, 2002; Krueger, Koo, & Lebwohl, 2001). Weiss et al. (2002) conducted a descriptive, prospective study consisting of 35 consecutive patients. Patients completed self-administered questionnaires including Satisfaction with Life Scale (SWLS), Euro-QOL (EQ-5D), and the Medical Outcomes Study Short Form 36 (SF-36). Psoriasis Area and Severity Index (PASI) was completed by two dermatologist investigators and the Self Assessed PASI (SAPASI) was completed by the participants. They found that 23% of patients altered their career choice due to the impact of their disease and 6% reported that they were 'often' or 'always' depressed due to their condition. In populations with chronic, disfiguring, and uncomfortable diseases, suicide is a concern (Weiss et al, 2002).

In secondary analysis of several observational studies Gupta and Gupta (1998) conducted a descriptive, observational study of 450 patients using the Carroll-Rating Scale for Depression (CRSD). They reported that 9.7% of patients experienced suicidal ideation with 5.5% experiencing it at the time of the study. Suicidal ideation was associated with higher depression scores and higher self- rating of disease (Gupta & Gupta, 1998).

Gelfand, Feldman, Stern, Thomas, Rolstad, and Margolis (2004) conducted a study evaluating the use of a comprehensive questionnaire to describe the determinants of quality of life in psoriasis patients. Gelfand and colleagues found that as skin involvement with psoriasis becomes more extensive, patients suffer more impairment in their quality of life. They also reported a weak negative correlation with quality of life and age, thereby identifying younger patients as being more impaired than older patients. In fact, young female patients were more impacted by their disease (Gelfand et al, 2004).

The studies evaluating quality of life in patients with psoriasis revealed that quality of life was better for patients in the later years of life. The studies also emphasize how the appearance of their skin influences decisions to participate in social activities and the types of careers that were chosen. Patients suffering with a chronic, visible disease may avoid social situations leading to a tendency to withdraw from society resulting in isolation, thereby increasing the presence of depressive symptoms. Patients with a diagnosis of indolent cancer experience a good quality of life when the symptoms of disease are minimal. Identification of a population that may need additional psychological support would allow health care providers to assist the patient to achieve and maintain a good quality of life.

Quality of Life in Patients with Cutaneous T Cell Lymphoma

There is limited research evaluating the quality of life in CTCL patients. Sampogna and colleagues (2009) conducted an observational, cross-sectional study to evaluate the

psychological distress and health related quality of life in 71 CTCL patients. Participants completed the Skindex-29, and EORTC QLQ-C30 questionnaires to assess their quality of life. The results demonstrated that the presence of the disease affected social interactions and intimacy with loved ones. They also found that impairment in global health status, emotional well-being, fatigue, and insomnia were worse in patients with advanced stage disease (Sampogna, et al, 2009).

Demierre and colleagues (2006) evaluated the quality of life of 630 CTCL patients (Demierre, Gan, Jones, & Miller, 2006). A four page self-administered questionnaire was mailed or completed online by patients who were members of the United States Mycosis Fungoides Foundation. The study was designed to evaluate patients' perspectives regarding the impact of CTCL and its treatment. Results demonstrated that 62% of participants reported they felt unattractive due to their disease. Respondents also noted that they felt ashamed of their disease when it was mistaken for a contagious condition. Greater than 80% of participants felt bothered by the itching, scaling, and skin redness. The disruption in the lives of CTCL patients was attributed to fatigue (66%) that resulted in days missed from work or school, and 43% stated that they felt they couldn't provide for their families. Limitations of this study included that some patients have limited access to health care and may not know of the United States Mycosis Fungoides Foundation (Demierre et al, 2006).

A smaller quality of life study was conducted by Demierre, Tien, and Miller (2005). This was a monocenter, cross-sectional study and consisted of 22 patients with CTCL with stage of disease ranging from IA to IVB. Ten patients had stage IA to IIA disease and 12 patients exhibited late stage disease (IIB-IVB). Mean age of participants was 63 years, majority of participants were white, and there were equal numbers of male and female participants. All participants completed a general HRQoL instrument (FACT-G) and a disease specific HRQoL

instrument (Skindex-29). They found that participants with higher stage disease reported a worse quality of life. Even participants with lower stage of disease reported alterations in their quality of life, and this became more pronounced as the disease progressed. Demierre et al. (2005) also reported that the impact of CTCL on functioning appeared to be similar to studies conducted for participants with psoriasis assessed utilizing the Skindex-29 questionnaire. Of note, the emotional status of CTCL participants was not as affected as was reported in the psoriasis participants although this may be attributed to the difference in the age of the participants, as psoriasis usually affects a younger population. A limitation of this study was the very small sample size (Demierre et al, 2005).

Duvic et al (2001) conducted a study to evaluate the effects of oral Bexarotene in patients with CTCL. The patients completed a general (Spitzer) QOL questionnaire and a non-validated CTCL specific QOL questionnaire once monthly for four months. A total of 94 patients with a confirmed diagnosis of CTCL were enrolled. The QOL scores did not change significantly throughout the study. The CTCL specific QOL instrument showed significant improvement in the symptoms from baseline to end of study. The results showed that pruritis improved from moderate to mild and satisfaction with appearance improved from moderately dissatisfied to neutral. Notably, the patients who received treatment with oral bexarotene reported better quality of life assessments even if they were considered non-responders to the medication (Duvic et al., 2001).

More recently, a study was conducted by Wright and colleagues (2013) to evaluate the prevalence and severity of pruritis and quality of life in patients with cutaneous T cell lymphoma (Wright, Wijeratne, Hung, Gao, Whittaker, Morris, Scarisbrick, & Beynon, 2013). They recruited 100 patients for participation in the study. Patients who met eligibility criteria completed the skindex-29 and the visual analogue scale for itch (VAS_{itch}). The Skindex-29 consists of 30

questions with one question not included in the analysis. Of the participants, 88% reported itching with 46% of these stating that it was often or always problematic. This study was effective in evaluating the presence of pruritis in the study participants; however, this patient population experiences a myriad of symptoms that were not assessed in this study (Wright et al., 2013).

There have been no studies conducted to evaluate spiritual well-being in CTCL patients. Research investigating spiritual well-being in patients with chronic, incurable, cancer, revealed negative correlations between spiritual well-being and ineffective coping styles such as avoidance, helplessness, and hopelessness (Cotton, Levine, Fitzpatrick, Dold, & Targ, 1999; Nelson, Rosenfeld, Breitbart, & Galietta, 2002; Krupski, Kwan, Fink, Sonn, Maliski, & Litwin, 2006; Bredle, Salsman, Debb, Arnold, & Cella, 2011). Whereas, positive spiritual well-being played an important part in effective coping and increased patient's QOL (Dapueto, Servente, Francolino, & Hahn, 2005; Whitford, Olver, & Peterson, 2008).

In summary, only limited research has been reported about the QOL of patients with cutaneous T cell Lymphoma, and with one exception, those studies have had small sample sizes and none has focused on predictors of quality of life in this patient group. The negative effect of depressive symptoms, fatigue, and anxiety, on QOL has been documented in patients with cancer (Butow, Coates, & Dunn, 1999). In patients with advanced cancer, spiritual well-being has been identified as an important factor in alleviating depressive symptoms, decreasing anxiety, and preserving or restoring good QOL (Tate & Forchheimer, 2002; Bredle, Salsman, Debb, Arnold, & Cella, 2011; Daugherty et al, 2005). Future research should investigate the physical symptoms, depressive symptoms, anxiety, fatigue distress, and spiritual well-being as factors that influence QOL in this special population. Further research is needed using a larger and more diverse sample.

Chapter III: Methods

This chapter discusses the design of the study, sample selection including inclusion and exclusion criteria, and the setting for the study. The measurement instruments that were used in the study are described and psychometric properties are delineated. The procedures for institutional approval, informed consent, and the analysis of the data are also described. This was a descriptive, exploratory, prospective study designed to examine the predictors of quality of life in patients with CTCL.

Institutional approvals

The Moffitt Scientific Review Committee (SRC) and the USF Institutional Review Board (IRB) received submissions of the protocol for their review. Written approval was obtained from both organizations and the study began in February, 2013 (Appendix A). The study took place at Moffitt Cancer Center & Research Institute in Tampa, Florida and was conducted over a seven month period.

Setting and Sample

CTCL participants were referred to the study from the cutaneous T cell lymphoma and the malignant hematology clinics at Moffitt Cancer Center between February 2013 and September 2013. Following approval by the Moffitt SRC and the USF IRB, access to the participants was based on referral by the physicians, nurses, and the manager in the cutaneous clinic at Moffitt Cancer Center. Seventy-five patients who had a confirmed diagnosis of CTCL were recruited for participation in the study. Inclusion criteria were: being able to read and understand English, being 18 years or older, and being alert and able to provide informed

consent. Exclusion criteria included minor children, patients with other new diagnoses of cancer within one year, and patients with altered mental status who were unable to provide consent. Participants were informed that the data will be de-identified and will remain anonymous.

Measures

The measures that were used in this study are described below. The individual scales are appended (Appendix B).

Quality of life

The Quality of Life Core Questionnaire of the European Organization for the Research and Treatment of Cancer (EORTC QLQC-30) was used to measure CTCL patients' QOL. This instrument consists of 30 items arranged within six scales of aspects of functioning (Dirmaier, Zaun, Koch, Harfst, & Schulz, 2004). These scales included physical (Cronbach's alpha 0.72-0.86), role (Cronbach's alpha 0.83-0.91), social (Cronbach's alpha 0.74-0.86), cognitive (Cronbach's alpha 0.56-0.70), and emotional functioning (Cronbach's alpha 0.69-0.87), and global quality of life (Cronbach's alpha 0.81-0.93). In addition, the scale consisted of three symptom subscales, fatigue (Cronbach's alpha 0.79-0.84), nausea/vomiting (Cronbach's alpha 0.60-0.77), and pain (Cronbach's alpha 0.73-0.76), and six symptom items including financial problems, constipation, diarrhea, dyspnea, sleep disorder, and loss of appetite. Items are measured on a four-point Likert type scale. The scores of the six functioning scales were calculated by adding up the raw scores of a scale and dividing by the number of items on that scale. The scores were mapped for each parameter onto a scale of zero-100, with 100 representing the highest level of functioning. The symptom scales were calculated in a similar fashion with the exception that higher scores indicated a higher symptom burden. For the purposes of this study, only the total score was used in the analyses. Cronbach's alpha for the

EORTC QLQ-C30 version 3, has been reported to be greater than 0.70, representing acceptable internal consistency (Dirmaier et al., 2004).

Dermatology related quality of life

The Skindex-29 is a disease specific instrument used to measure the effects of dermatological disease on the quality of life in CTCL patients. This instrument is a 29-item questionnaire focusing on three dimensions: Symptoms (seven items), emotions (10 items), and functioning (12 items). The Skindex-29 is a five point Likert type scale. The overall score, as well as the individualized scores for each dimension are converted to a scale of zero (no impact on QOL) to 100 (maximum impact on QOL). Internal consistency reliability has ranged from 0.86-0.95 (Chren, Lasek, Flock, & Zyzanski, 1997).

The Skindex-16 is a shortened version of the Skindex-29, addressing 16 questions that measure bother rather than frequency of symptoms. It is because of this difference the SkinDex-16 and SkinDex-29 will be evaluated to determine if one instrument is superior for use in this specific population. The SkinDex-16 is scored on a bipolar scale with seven response choices ranging from "never bothered" to "always bothered". There are three subscales consisting of symptoms, emotions, and functioning. Scores range from zero-100 and internal reliability has been demonstrated with a Cronbach's alpha of 0.86-0.93 (Chren, Lasek, Sahay, & Sands, 2001).

Depressive Symptoms

The Center for Epidemiologic Studies Depression (CES-D) scale is a widely used self-report instrument to measure depressive symptoms. The CES-D consists of 20 items and is purported to measure important components of depressive symptoms including feelings of helplessness and hopelessness, feelings of guilt and worthlessness, depressed mood, psychomotor retardation, loss of appetite, and sleep disturbances. There are 20 items that

have been clustered into four dimensions 1) depressed affect 2) positive affect 3) somatic-retarded activity and 4) interpersonal relations (Radloff, 1977). Scores on the CES-D can range from zero-60. Although the CES-D does not diagnose depression, a total score of 16 or higher requires further screening for major depression, and a score greater than 23 may indicate probable depression. Cronbach's alpha for the CES-D has been reported to be greater than 0.80 representing good internal consistency (Schroevers, Sanderman, Sonderen, & Ranchor, 2000).

Anxiety

The state-trait anxiety inventory is an instrument commonly used to measure state and trait anxiety (Spielbeger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). The Y form consists of 20 items evaluating state anxiety and 20 items evaluating trait anxiety. All items are scored on a four point Likert-type scale, from "almost never" to "almost always". High levels of anxiety are indicated by higher scores. Internal consistency coefficients range from 0.86 to 0.95 (Spielberger et al., 1983). Only the state anxiety inventory will be used in this study.

Spiritual Wellbeing

The Functional Assessment of Chronic Illness Therapy-Spiritual Well-Being scale (FACIT-SP) was developed to address the need for a broad measure of spiritual well-being (Cella, Tulsky, Gray, Sarafian, Linn, et al., 1993). This is a 12 item measurement tool consisting of three subscales (peace, meaning, and faith). This is a self-administered, five point Likert-type scale that measures distress and is scored on a zero (not at all) to four (very much) scale. Higher scores represent greater spiritual well-being. This measurement tool has been validated in cancer patients and patients receiving hospice services. The Cronbach's alpha coefficient for the 12 item instrument has been reported to be 0.81-0.88 (Cella, et al. 1993; Bredle, et al, 2011).

Cancer Related Fatigue

Cancer Related Fatigue Distress Scale (CRFDS) evaluates the distress experienced by patients who suffer from the symptom of fatigue (Holley, 2000). The instrument consists of 20 items and encompasses the cognitive, psychological, physical, social, and spiritual domains. It is scored on an 11 point Likert type scale, zero (no distress) to 10 (severe distress). The scores are summed and range from 0-200 with higher scores indicating a higher level of fatigue distress. There are three additional questions rating fatigue at the time of completion of the survey, worst fatigue over the past week and usual amount of fatigue. There are three additional questions addressing level of fatigue over the past week, usual level of fatigue, and level of fatigue now. The CRFDS has an alpha coefficient of 0.98 (Holley, 2000).

Demographic form

Demographic data was obtained to describe the characteristics of the sample. The investigator developed demographic form constructed for the study included gender, race, age, marital status, type and stage of disease, time since diagnosis, religious affiliation, and level of education.

Procedures

After the protocol was approved by the Moffitt SRC and the USF IRB, physicians began to refer patients who were identified as eligible for participation. Once referred, the patients underwent further screening by the investigator to confirm eligibility. Following confirmation of eligibility, patients were approached for participation. The patient was escorted to an exam room in the cutaneous or the hematology clinic to ensure privacy and confidentiality. The consent and protocol of the study was explained in detail and questions were answered to the patient's satisfaction. If the patient consented to participation, one copy of the consent remained in the research folder and the patient received a copy of the consent. Data collection

began with administration of the Skindex-29, QLQ-C30, CES-D, STAI, FACIT-Sp, cancer related fatigue distress scale, Skindex-16, and the demographic form. Completion of these forms completed the patient's participation in the study.

Analysis of data

All data was analyzed using SPSS version 21 statistical software (IBM, Somers, NY). To analyze demographic data, descriptive statistics were used including means, standard deviations, frequencies and percentages. All multi-item instruments were evaluated for internal consistency and reliability and alpha coefficients were obtained. To meet the specific aims, the following analyses were conducted:

1. To examine factors that may predict the quality of life of patients with CTCL, means and standard deviations were calculated for the EORTC QLQ C-30, Skindex-29 and Skindex-16.
2. To evaluate the psychosocial burden (depression, anxiety, fatigue, and spiritual well-being) of CTCL, means and standard deviations were calculated for the STAI, CES-D, CRFDS, and FACIT-Sp.
3. To examine the influence of depression, anxiety, time since diagnosis, selected demographic variables including age and gender, as predictors of quality of life of CTCL, were calculated using multiple regression analysis.
4. To compare the Skindex-29 and the Skindex-16, convergent validity was assessed using Pearson's correlation coefficient.

Chapter Four: Results

This chapter presents the results of the study. First the sample is described; this is followed by means and standard deviations for all of the measures used in the study. Finally, specific aims are addressed.

Sample

The sample consisted of 75 participants, with slightly more men than women, all with a confirmed diagnosis of cutaneous T cell lymphoma. The majority of participants were diagnosed with stage IA, IB, or IIA disease. The majority of the patients were white, married, and had a Christian religious affiliation (Table 3). The age of the participants ranged from 24 to 88 years of age, with a mean of 62.5 years and a standard deviation of 14.6. The range of years of education was 10 to 24 years. Of the participants, 22 (29.3%) had at least some high school education and most (N=53, 70.5%) had college education (Table 4).

Table 3. **Frequencies and Percentages of the Demographic Variables of the Sample (n=75).**

Variable	Frequency	Percent
Gender		
Male	41	54.7
Female	34	45.3
Ethnicity		
White	54	72

Table 3 (continued)

Black	16	21.3
Hispanic	5	6.7
Stage of Disease		
IA	24	32
IB	19	25.3
IIA	4	5.3
IIB	8	10.7
IIIA	2	2.7
IIIB	6	8.0
IVA	10	13.3
IVB	1	1.3
Marital status		
Married	51	68
Single	12	16
Widowed	6	8
Divorced	6	8
Religion		
Non-Catholic Christian	44	58.7
Catholic	24	32.0
Jewish	3	4
None	2	2.7
Muslim	1	1.3
Other, non-specified	1	1.3

Table 4. Mean, Standard Deviations, and Range for Demographic Variables of the Sample (n=75).

Variable	Mean	Range	SD
Age	62.5	(24-88)	14.6
Years of education	15.0	(10-24)	2.8
Time since diagnosis	5.0	(1-31)	5.2

Descriptive Data

The means and standard deviations of depressive symptoms, anxiety, fatigue distress, and spiritual well-being scores are delineated in Table 5. Also included are the mean and standard deviation of the outcome variable, quality of life.

Table 5. Means and Standard Deviations of Patients' scores on Quality of Life, Anxiety, Depressive Symptoms, Spiritual Well-being, and Fatigue Distress. (N=75)

Variable	Range	Mean	SD
Depressive symptoms	0-60	11.0	11.9
Anxiety	20-80	34.7	14.6
Fatigue distress	0-200	48.6	55.5
Quality of life	0-100	68.9	22.4
Spiritual well-being	0-156	118.5	30.2

All instruments used in this study were tested for their reliability when utilized among this specific population of cutaneous T cell Lymphoma patients. The Cronbach's alpha coefficients were strong with all being greater than 0.70, and most of them being greater than 0.90 (Table 6).

Table 6. Reliabilities of the Measurement Instruments

Instrument	Cronbach's alpha
Cancer related fatigue distress scale	0.99
SkinDex-29	0.98
SkinDex-16	0.96
State anxiety	0.96
CES-D	0.94
EORTC QLQ-C30	0.92
FACIT-Sp	0.77

The items of the SkinDex-29 were evaluated for the rate of responses to each item (Table 7). Responses included were "never", "rarely", "sometimes", "often", and "all the time". Skin itching and skin irritation were the most frequently reported symptoms. The highest mean scores were found in the most frequently occurring symptoms.

Table 7. Frequency, Percent, Means, and Standard Deviations of Responses to SkinDex-29 Items

Item	Frequency	Percent	Mean	SD
Skin itching	70	93	58.3	29.2
Skin irritated	68	91	54.0	29.1
Worry about severity	67	89	55.7	31.2
Worry about progression	66	88	57.7	31.6
Annoyed	64	85	50.7	32.4
Skin sensitive	64	85	57.0	33.5
Frustrated	63	84	51.7	33.0
Depressed	51	68	34.7	32.9

Table 7 (continued)

Disrupted sleep	51	68	38.0	34.7
Skin pain	46	61	32.7	32.9
Skin burns/stings	46	61	33.7	34.8
Embarrassed	44	59	32.0	34.5
Worry about scars	44	59	29.7	31.5
Ashamed	43	57	30.7	33.8
Tired	43	57	35.7	37.2
Affects social life	42	56	31.7	35.0
Angry	39	52	30.7	35.5
Affects closeness to loved ones	39	51	23.0	28.7
Affects work/hobbies	36	48	28.0	36.8
Water bothers	36	48	27.0	34.6
Affects interactions with others	36	48	25.0	31.6
Affects desire to be with others	36	48	26.0	32.7
Humiliated by skin	35	47	23.0	29.6
Difficult showing affection	35	47	23.0	31.0
Stay at home	34	45	25.3	34.3
Do things alone	33	44	23.0	32.6
Interferes with sex life	33	44	23.0	32.5
Skin bleeds	31	41	18.7	26.7

Influence of Predictor Variables on QOL

The predictor variables that demonstrated a significant bivariate correlation with QOL were included in the regression analysis. A spearman correlation was utilized in the evaluation of a relationship among stage of disease and quality of life. The variables of stage of disease,

depressive symptoms, anxiety, spiritual well-being, and fatigue distress all demonstrated a significant P value of less than 0.001 (Table 8). The correlations reveal that as the symptoms of depression, anxiety, and fatigue distress increase, the QOL decreases. Also, because the SkinDex instruments demonstrate a negative correlation, this shows that as the cutaneous manifestations become worse patients experience worse QOL. Spiritual well-being had a positive correlation with QOL, meaning that as spiritual well-being increases the QOL increases.

Table 8. Correlation of Predictors with Quality of Life (n=75)

Variable	**r**	**P**
Stage of disease	-0.450	<0.001
Depressive symptoms	-0.710	<0.001
Anxiety	-0.641	<0.001
Spirituality	0.729	<0.001
Fatigue distress	-0.710	<0.001
SkinDex-29	-0.644	<0.001
SkinDex-16	-0.569	<0.001

Categorical variables were evaluated using an independent samples t-test (Table 9). Quality of life scores did not differ by ethnicity, marital status, or gender and thus, were not significantly related to QOL. Therefore, these variables were omitted from the regression analysis.

Table 9. Independent Samples t-Test Results of Ethnicity, Marital Status, and Gender with QOL

Variable	N	mean	t	P
Ethnicity				
White	54	71.1	-1.409	0.163
Non-white	21	63.1		
Marital status				
Married	51	72.5	-1.909	0.064
Not married	24	61.1		
Gender				
Male	41	72.6	1.578	0.119
Female	34	64.5		

The subsequent regression analysis (Table 10) revealed that only depressive symptoms (CES-D) and stage of disease had a significant relationship with QOL. More specifically, as the stage of disease increased, there was a decrease in the QOL. Likewise, as the depressive symptoms increased the QOL decreased. These results identify stage of disease and depressive symptoms as having statistically significant influences on the outcome, QOL.

Table 10. Regression of Predictor Variables on QOL

Variable	B	Standard error of B	B	t	P
Stage of disease	-11.028	3.719	-0.240	-3.0	0.004
Depressive symptoms	-0.701	0.295	-0.373	-2.4	0.020
Anxiety	0.204	0.243	0.133	0.8	0.404
Spiritual well-being	0.189	0.142	0.255	1.3	0.187
Fatigue distress	-0.024	0.069	-0.353	0.7	-0.060
SkinDex-29	-0.105	0.117	-0.115	0.896	-0.374

Relationship Among the SkinDex-16, SkinDex-29, and the Predictor Variables

To evaluate the relationship between the SkinDex-16 and Skindex-29, correlations were conducted among the subscales as well as the total scores for both. The results of the correlations revealed a strong relationship among the subscales of each instrument and within each instrument as well as among the total scores of both instruments (Table 11).

Table 11. Correlation of SkinDex-29 and SkinDex-16 Measurement Tools (n=75)

Variable[a]	SD29E	SD29F	SD29S	SD29T	SD16E	SD16F	SD16S	SD16T
SD29E	-	-	-	-	-	-	-	-
SD29F	0.859*	-	-	-	-	-	-	-
SD29S	0.702*	0.802*	-	-	-	-	-	-
SD29T	0.926*	0.958*	0.895*	-	-	-	-	-
SD16E	0.847*	0.732*	0.651*	0.805*	-	-	-	-
SD16F	0.806*	0.857*	0.621*	0.825*	0.830*	-	-	-
SD16S	0.563*	0.634*	0.781*	0.708*	0.747*	0.619*	-	-
SD16T	0.815*	0.817*	0.755*	0.859*	0.949*	0.900*	0.870*	-

[a]E, Emotions; F, Function; S, Symptoms; T, Total; *Significance <0.001

Each predictor of fatigue distress, depressive symptoms, anxiety, and spirituality, the demographic variables of stage of disease, age, gender, ethnicity, and level of education, were correlated with the SkinDex-16 and SkinDex-29. The results of the correlations with SkinDex-29 revealed that as the cutaneous symptoms become worse, spiritual wellbeing decreases (Table 12). The correlations of significant predictor variables and SkinDex-16 are also presented in Table 12. There were negative correlations noted between the SkinDex-16 and spirituality and SkinDex-16 and age. This demonstrates that as participants age they were less likely to have or complain of cutaneous symptoms.

Table 12. Correlation of Individual Predictors with the SkinDex-29 and the SkinDex-16

Correlation	**SkinDex-29**		**SkinDex-16**	
	r	P	r	P
Anxiety	0.691	<0.001	0.697	<0.001
Depressive symptoms	0.736	<0.001	0.636	<0.001
Spirituality	-0.744	<0.001	-0.705	<0.001
Fatigue distress	0.787	<0.001	0.745	<0.001
Stage of disease	0.281	0.007	0.251	0.015
Age	-0.327	0.002	-0.372	0.001
Level of Education	-0.258	0.013	-	-

An independent samples t-test was conducted to evaluate the variables of ethnicity, gender, and marital status for the presence of a significant relationship with QOL (Table 13). Ethnicity and gender were significantly associated with both the Skindex-16 and the Skindex-29. Marital status did not demonstrate a significant relationship with the Skindex-16 and Skindex-29.

Table 13. Independent Samples t-Test Results of Ethnicity, Marital Status, and Gender with SkinDex-29 and SkinDex-16.

Variable	N	mean	t	P
SkinDex-29				
Ethnicity				
White	54	44.7	2.108	0.038
Non-white	21	31.8		
Marital status				
Married	51	32.9	1.309	0.195
Not married	24	40.8		
Gender				
Male	41	27.3	-3.350	0.001
Table 13 (Continued)				
Female	34	45.1		
SkinDex-16				
Ethnicity				
White	54	47.1	2.392	0.019
Non-white	21	30.2		
Marital status				
Married	51	31.2	1.690	0.095
Not married	24	42.9		
Gender				
Male	41	26	-3.163	0.002
Female	34	45.6		

When the predictor variables were regressed onto the SkinDex-29, the variables of depressive symptoms, fatigue distress, and age revealed statistically significant relationships

(Table 14), indicating that these variables exhibit significant relationships with cutaneous symptoms.

Table 14. Regression of Predictor Variables onto SkinDex-29 (n=75)

Variable	B	Standard error of B	B	t	P
Stage of disease	6.153	4.005	0.122	1.536	0.129
Depressive symptoms	0.596	0.295	0.290	2.021	0.047
Anxiety	-0.203	0.254	-0.121	-0.801	0.426
Spirituality	-0.080	0.145	-0.098	-0.550	0.584
Fatigue distress	0.204	0.067	0.463	3.055	0.003
Age	-0.299	0.150	-0.178	-2.003	0.049
Gender	5.619	3.639	0.115	1.544	0.127
Ethnicity	-0.123	4.606	-0.002	-0.027	0.979
Education	0.100	0.648	0.011	0.155	0.878

The regression of predictor variables onto the SkinDex-16 showed that fatigue distress was the only variable with a statistically significant relationship. The variable of education was excluded from this analysis due to a lack of correlation with the SkinDex-16 instrument. The positive correlation between the SkinDex-16 and fatigue distress shows that as skin manifestations become more bothersome, fatigue distress increases (Table 15).

Table 15. Regression of Predictor Variables onto SkinDex-16 (n=75)

Variable	B	Standard error of B	B	t	P
Stage of disease	5.201	5.017	0.090	1.037	0.304
Depressive symptoms	-0.202	0.369	-0.085	-0.549	0.585
Anxiety	0.381	0.316	0.196	1.205	0.232
Spirituality	-0.189	0.181	-0.202	-1.042	0.301
Fatigue distress	0.177	0.083	0.347	2.128	0.037
Age	-0.359	0.187	-0.185	-1.923	0.059
Gender	7.540	4.527	0.134	1.666	0.101
Ethnicity	-4.825	5.752	-0.077	-0.839	0.405

Chapter 5 Discussion, Implications and Conclusions

This chapter discusses the findings presented in Chapter 4. The sample and descriptive data are interpreted. The influence of the predictor variables on quality of life and the relationship among the SkinDex instruments and the predictor variables also are discussed.

Sample

The sample involved 75 participants with cutaneous T cell lymphoma (CTCL). Most participants were male with stage IA disease. The mean age of the participants was noted to be approximately 62 years, which supports prior research that CTCL is a disease of a slightly older population. However, the age range from 24-88 years reinforces that CTCL can affect anyone along the age spectrum. A power analysis was conducted prior to data collection, and a sample size of 83 was recommended. This was calculated where the Pearson's correlation coefficient was 0.3 and the test of significance assumed alpha 0.05, with power 0.80. The sample size dictated by the power analysis was not achieved due to a short recruitment time and a single researcher available to recruit participants. Even though the goal sample size of 83 was not obtained, the sample size of 75 produced statistically significant results.

Descriptive Data

The mean of the CES-D, which evaluates depressive symptoms, was noted to be 11 on a scale of 0 to 60. It has been documented that a score of 16 or higher requires further evaluation for the presence of major depression (DSM-IV, 2004). Furthermore, a score of 23 or greater may indicate probable depression. The mean score in the CTCL population was much lower than either of these thresholds, indicating that depressive symptoms were not prevalent

or severe in this sample. Some of this variability may be due to the fact that most participants (62.6%) had low stage disease (≤ stage IIA) and only 36% had advanced stage disease (≥ stage IIB). Given that more than half of this group had early stage disease, the low mean score on the CES-D should not be surprising and may not be representative of the patients with higher stage disease (≥stage IIB).

The state portion of the state-trait anxiety inventory was used to evaluate the presence of anxiety in the sample. Their mean score was 34.73, while the scores can range between 20 and 80. The mean result demonstrates that on average anxiety is low in this group. A majority of the participants in the sample (47 of 75) had disease that required minimal to no treatment. It would be expected that an incurable disease would cause an increase in the amount of anxiety experienced by participants; however, the results revealed a contrary outcome. The realization that the treatment regimen for these participants is not invasive and should not have an impact on their normal activities of daily living, may lead to a lower level of anxiety for most this sample or may allow them to use the defense mechanism of denial.

The presence of fatigue in cancer patients has been well documented, and is reported to affect approximately 75% of cancer patients (Yennurajalingam, Palmer, Zhang, Poulter, & Brurera, 2008). It has also been documented in the CTCL population with higher levels of fatigue found in patients with higher stage of disease (Demierre et al, 2005). The cancer related fatigue distress scale (CRFDS) has been validated and utilized to evaluate how distressing fatigue can be for patients with cancer. Most patients reported the presence of fatigue (n=52) but few reported a high level of distress related to the fatigue. The mean score for fatigue distress was 48.6, much less than the highest score of 200. These results demonstrate that high levels of fatigue distress were not frequently reported by this sample.

Quality of life was moderately high with the mean score for the sample being reported as 68.9 on a scale of 0 to 100. This mean score demonstrates that the sample has been able to maintain a very good quality of life even though they have a diagnosis of an incurable cancer. Again, these results may be more representative of participants with minimal disease burden and therefore, minimal to no need for systemic treatment. It is expected that patients with more advanced disease would experience a decrease in their quality of life. This may be attributed to symptoms of disease, side effects of treatment, or the physical and mental burden of treatment. Overall, these results seem to indicate that the quality of life for the participants in this group is good. Future studies should include patients with more advanced disease.

The variable of spiritual well-being was measured by the FACIT-Sp and revealed a mean score of 118.49 on a scale of 0 to 156. So, the results from this study demonstrate that participants in the sample, who were predominantly Christian, had moderately high reports of spiritual well-being. It has been reported that high levels of spiritual well-being are associated with higher levels of quality of life for cancer patients (Bredle, et al, 2011).

All of the instruments used in this study have been validated and shown to be reliable (Dirmaier et al., 2004; Chren et al., 1997; Chren et al., 2001; Schroevers et al., 2000; Spielberger et al., 1983; Cella, et al. 1993; Bredle, et al, 2011; Holley, 200). The reliabilities for each measurement instrument utilized in this study were calculated and most demonstrated high reliabilities. All instruments demonstrated alpha coefficients greater than 0.90 with the exception of the FACIT-Sp, which demonstrated an alpha coefficient of 0.77. Although lower than the other instruments, this alpha of 0.77 is certainly acceptable. The CTCL population has not been studied extensively; therefore, the results of the reliability coefficients are important in this population to lay a foundation for future research.

Each of the items on the SkinDex-29 instrument was evaluated to determine which cutaneous related symptoms were the most frequently reported. The number of responses included participants who answered "rarely", "sometimes", "often", and "all the time". The most frequent symptoms reported were skin itching and skin irritation. The least frequently reported symptoms included how the disease affected interaction with others and skin bleeding. It was not stratified to evaluate how many participants answered at each of the four levels. This would be helpful in determining how much each symptom affected the participants and should be included in future research.

Influence of Predictor Variables on Quality of Life

Correlations of the predictor variables were conducted prior to the regression to evaluate if there were relationships worthy of investigating. The variables of gender and ethnicity (white vs. non-white) were evaluated using an independent samples t-test. This method revealed non-significant differences among these groups on their QOL scores and they were excluded from the subsequent regression analysis. Stage of disease was evaluated using a Spearman correlation and was found to have a significant relationship with the outcome variable QOL. Bivariate correlations were calculated between the continuous variables and QOL. The variables that demonstrated a statistically significant relationship with QOL were included in the regression analysis. Ethnicity and gender did not demonstrate significant correlation with QOL and therefore, were not included in the regression analysis.

The regression analysis revealed that only depressive symptoms ($p=0.039$) and stage of disease ($p=0.002$) were identified as predictors of QOL in the sample. The influence of depressive symptoms on QOL in patients with a diagnosis of incurable cancer has been demonstrated in previous research (Warmenhoven et al., 2011). The concurrent occurrence of multiple somatic symptoms, especially when they are uncontrolled, has been found to be

predictive of the development of depressive symptoms (Chen & Chang, 2004; Lloyd-Williams, Shiels, Taylor, and Dennis, 2009). Participants with advanced stage of CTCL would be expected to have worse QOL as opposed to participants with lower stage of disease because they have more cutaneous and quite possibly systemic symptoms (Weiss et al, 2002, Gelfand et al, 2004). Research has shown that in patients with chronic lymphocytic leukemia, another type of indolent disease, good QOL is preserved until they experience an increase in the frequency of symptoms (Shanafelt et al, 2007). Patients diagnosed with stage I CTCL have been shown to have a normal life span and may not be as affected by the psychological side effects of having an incurable diagnosis (Demierre et al, 2006). This lends support to the lack of influence of anxiety as a predictor of QOL in this study. Anxiety would be expected to be a significant predictor of QOL in a population with more advanced disease.

Spiritual well-being did not exhibit a significant relationship as a predictor of QOL. These findings might have been different if the sample included more participants with advanced stage disease. It has been shown that an increased level of spiritual well-being is associated with a lower level of depression experienced by patients with cancer (Bredle, et al, 2011); thus, QOL would be expected to be improved by decreased depression and improved spiritual well-being.

Fatigue distress was also not identified as a predictor of QOL. Again, this finding would be expected in this sample with so many participants having low stage disease. The majority of these patients (n= 54) were receiving non-invasive therapy in the form of topical creams used as needed or exposure to ultraviolet light on a weekly basis and reported low levels of fatigue distress. It is known that patients with advanced stages of cancer experience fatigue, either as a side effect of the disease process or as a side effect of the treatment of their cancer (Demierre et al, 2006). Future studies should focus on patients with higher stage disease.

Surprisingly, the SkinDex-29, a dermatologic specific measure of QOL, did not exhibit a significant influence as a predictor of QOL in this sample. Previous research has shown that dermatological symptoms, more specifically pruritis, are the most distressing symptoms for patients with CTCL (Demierre et al, 2005). The results of this study speak to how important stage of disease is as a predictor of QOL.

Relationship Among The SkinDex-16, SkinDex-29, and the Predictor Variables

One of the specific aims of the study was to evaluate which dermatologic specific measurement tool was more appropriate to use in the study of CTCL patients. The SkinDex-29 has been used more frequently in dermatologic studies. It measures how frequently symptoms are experienced. The SkinDex-16 was derived from the SkinDex-29 and measures how severe the symptoms are when they are experienced. In order to establish the relationship between these two instruments bivariate correlations were conducted between each of the subscales and the total score for each instrument. As presented in Chapter 4, the Pearson correlation coefficient between the two scales was high ($r=0.86$; $p<0.001$). This finding is not surprising given that the SkinDex-16 was derived from the SkinDex-29, and provides additional evidence of construct validity for the newer Skindex-16. In addition, the subscales of the shortened Skindex-16 were strongly correlated with the matching subscales of the Skindex-29 ($r=0.76$-0.86; $p<0.001$). This offers further support for the construct validity of the Skindex-16.

Bivariate correlations were conducted among the predictor variables and each SkinDex measurement instrument. Because the correlations between the subscales and the total scores of the SkinDex-16 and SkinDEx-29 were so high, only the total scores were used for the correlation calculations. Significant correlations were noted among anxiety, depressive symptoms, spirituality, fatigue distress, age and both the SkinDex-29 and SkinDex-16. All variables with significant correlations with the SkinDex instruments were included in a

regression analysis. Level of education was significantly correlated with SkinDex-29 but not with SkinDex-16 therefore, it was omitted from the SkinDex-16 regression analysis. Independent samples t-tests were conducted for the categorical variables of gender, ethnicity, and stage of disease. The t-test results demonstrated statistically significant relationships and these variables were ultimately included in the regression analysis.

The predictor variables were regressed onto the SkinDex-16 and SkinDex-29 to evaluate for significant relationships. The variables of depressive symptoms, age, and fatigue distress were shown have significant relationships with the SkinDex-29. It has been shown that as age increases participants are less likely to report symptoms when compared to a younger population who has been diagnosed with a very visible skin condition (Gelfand et al, 2004).

Depressive symptoms demonstrated a significant positive relationship with the SkinDex-29. These results are not surprising due to the fact that as dermatologic symptoms increase, the level of depressive symptoms would also increase. Any indication of disease progression in a patient with a cancer diagnosis would enhance an expectation of an increase in depressive symptoms. Also, fatigue distress demonstrated a positive correlation with Skin-Dex-29. Fatigue is a known side effect of cancer and the treatment for cancer and is commonly associated with depression. As disease progresses, it would be expected that fatigue would increase also. When fatigue interferes with activities of daily living, or normal activities it causes distress for the participants. Therefore, the positive correlation between fatigue distress and increased dermatologic symptoms would be expected. It's important to note that older patients are typically retired and have the ability to rest when they feel fatigue. A younger population that may be responsible for maintaining a job and caring for a family may find the fatigue to be more distressing.

In the regression analysis of the predictor variables onto SkinDex-16, the only variable that demonstrated a significant relationship was fatigue distress. This positive relationship reveals that as the severity of the dermatologic symptoms increases, fatigue distress increases as well. Ultimately, when comparing The SkinDex-16 and SkinDex-29 for usefulness, no difference was identified. The two measurement tools were closely correlated and appeared to measure the same constructs. Thus, the shorter tool, the Skindex-16, may be more useful in a busy clinical practice. However, in research it may be more suitable to utilize the Skindex-29 as it offers more variety in the information obtained.

Implications of the Study

The results of this study have identified significant predictors of QOL and identified relationships among variables that evaluate the effect of cutaneous symptoms and how they contribute to the QOL. Some of the measurement instruments utilized in this study were closely correlated and may have measured some of the same constructs. Factors that may have influenced the outcome of the study included when patients have their disease staged. Patients are staged at their initial visit to an oncologist. As they receive treatment for their disease, their stage of disease improves, thereby improving their quality of life. The initial stage at diagnosis follows the patient through their treatment trajectory and never changes even if their clinical stage improves or worsens. These are factors that need to be noted when evaluating results based on stage of disease. Mean scores were reported, meaning that although some of the participants experienced little impact of depressive symptoms or anxiety, there were some participants who were more impacted by these symptoms. Evaluating for predictors that influence the QOL helps us to better understand the needs of the patients afflicted with CTCL. The importance of studying the QOL of the CTCL patients lies in the fact that we as nurses can assist in alleviating some of the symptoms experienced by the patients,

thereby improving their QOL. Further study is warranted in developing interventions to assist in the preservation of QOL.

Limitations of the study include that there was only one researcher to obtain informed consent and administer the compiled surveys for completion. This may have contributed to eligible participants not being approached for participation in the study. A significant number of participants (n=47) had low stage disease, that may not require any specific therapy. There was an under-representation of participants with advanced stage disease, which likely affected the results. Most of the participants were white, lending to an under-representation of minority groups. Due to the number of participants that had stage IIA disease or less, these results may represent information for patients with low stage disease. It might be expected that results may be significantly different when these measurement instruments are administered to a higher population of patients with advanced stage disease (stage IIB and higher).

A strength of the study is that this disease state makes up less than 3% (approximately 1500-3000 patients) of non-Hodgkin lymphoma diagnoses every year, yet 75 participants agreed to complete the surveys investigating how their disease affects their quality of life. It was wonderful to have so many willing participants from a rare and under-studied disease state.

Implications for nursing are that nurses offer a great wealth of knowledge and education in managing side effects of cancer and its treatment. Patients with skin diseases are at high risk of infection, especially if they are exhibiting high symptom burden and suffering from pruritis. Nurses can provide education to patients, colleagues, and students regarding good skin care, effective management of the side effects of this disease and prevention of infection. In the clinical setting, education is important to putting the patient at a psychological advantage when coping with an incurable disease. Providing support both mentally and physically is

important for providing adequate care for patients with CTCL. The integration of effective nursing interventions is important in the care of patients with chronic skin conditions and this is an area where research can be expanded.

Conclusions

In conclusion, the results of this study revealed that stage of disease and the presence of depressive symptoms influenced the QOL of patients with CTCL. This is expected because patients with later stage of disease would have a worse QOL. Also, participants with an increased number of depressive symptoms would have a worse QOL. These findings have been well established in the literature and are echoed in the results of this study. The significant influence of depressive symptoms may be alleviated with the implementation of support groups for patients diagnosed with CTCL. Assessing for these symptoms in the clinical setting may also identify patients who are more affected. Early identification would allow the healthcare provider to refer patients experiencing more severe symptoms of depression for further evaluation by a specialist.

The SkinDex-16 and the SkinDex-29 were evaluated to determine which would be better suited for use in this population. The SkinDex-16 is shorter and less burdensome for patients to complete therefore, it is reasonable for this measure to be used in future studies of this population. Stage of disease also demonstrated a significant relationship with QOL. Evaluating dermatologic symptoms experienced by patients may be an indication that the disease is progressing and may need supportive care and medical intervention. Supportive care in the form of moisturizing creams can be initiated by the nurses in the clinical setting. Promotion of good skin care will help decrease the desire to itch and maintain the integrity of the skin, which will decrease the risk of a life threatening infection.

Future studies could be conducted to include a larger sample of participants with advanced (stage IIB and higher) disease. This was designed as an exploratory study. The patients completed surveys evaluating for anxiety, depressive symptoms, fatigue distress, spiritual well-being, QOL, and dermatologic symptoms. It is known that some of these instruments measure similar constructs. It is plausible that multi-colinearity may account for the lack of significance of anxiety or fatigue distress on QOL. In future studies, it would be helpful to focus on fewer variables to highlight the influence on QOL in CTCL patients. In addition, studies to incorporate nursing interventions for skin care and wound care management would also be beneficial.

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Appendices

Appendix A: Institutional Approvals

DIVISION OF RESEARCH INTEGRITY AND COMPLIANCE
Institutional Review Boards, FWA No. 00001669
12901 Bruce B. Downs Blvd., MDC035 • Tampa, FL 33612-4799
(813) 974-5638 • FAX (813) 974-5618

February 13, 2013

Darcie Deaver, MSN, NP-C
H Lee Moffitt Cancer Center
12902 Magnolia Drive
Tampa, FL 33612

RE: **Expedited Approval** for Initial Review
IRB#: Pro00011160
Title: Predictors of Quality of Life in Patients with Cutaneous T cell Lymphoma

Dear Ms. Deaver:

On 2/12/2013 the Institutional Review Board (IRB) reviewed and **APPROVED** the above referenced protocol. Please note that your approval for this study will expire on 02/12/2014.

Approved Items:
Protocol Document(s):
Predictors of Quality of Life in Patients with Cutaneous T Cell Lymphoma v3 02-08-2013

Consent/Assent Documents:
Consent v3 02-08-2013.pdf

It was the determination of the IRB that your study qualified for expedited review which includes activities that (1) present no more than minimal risk to human subjects, and (2) involve only procedures listed in one or more of the categories outlined below. The IRB may review research through the expedited review procedure authorized by 45CFR46.110 and 21 CFR 56.110. The research proposed in this study is categorized under the following expedited review category:

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

October 4, 2012

Darcie Deaver, MS, ARNP
H. Lee Moffitt Cancer Center & Research Institute
12902 Magnolia Drive
Tampa, FL 33612

Dear Ms. Deaver:

The Behavioral Subcommittee of the Scientific Review Committee (SRC) has reviewed your response for your research protocol entitled, **"Predictors of Quality of Life in Patients with Cutaneous T cell Lymphoma"** (MCC 17238). The revised protocol version dated 09/28/2012 is approved as written for use at the Moffitt Cancer Center pending approval of the Institutional Review Board (IRB) and satisfaction of institutional operational and financial review requirements.

Please be aware that after you receive IRB approval, you must request study activation before you commence any study activities. Please contact PSO mailbox at PSOmailbox@moffitt.org to request study activation. That office will ensure that all applicable institutional reviews have been completed. You will then be issued an automated activation notification by email.

It is your responsibility to ensure that all Moffitt staff (nursing, pharmacy, data management, etc.) are informed and aware of the details of the project. The committee encourages the use of in-services for those projects that are complex or require special attention.

All changes made to protocols approved by the SRC must be submitted to the Protocol Review and Monitoring System office. Changes made to the protocol document require SRC review and approval. Minor changes (i.e. changes to personnel, non-scientific changes, changes that do not affect patient participation) will be expedited through the SRC review process.

If this project is not being managed by the Clinical Trials Office or Clinical Research Unit, then it is your responsibility to follow through with all requirements for submission to the IRB. All IRB approvals are required to be documented in Oncore, and all associated regulatory documentation (signed applications, IRB approval letters and IRB approved consent forms, etc.) are to be saved in the appropriate study folder in the e-binders directory at J:\ebinders.

Oncore is the Cancer Center's mechanism for submission and review of materials requiring Scientific Review (SRC) and Protocol Monitoring (PMC). If you need access to Oncore, please contact Jeryl Madden, Oncore Administrator, at 745-6964 for assistance.

Sincerely,

David Drobes, PhD.
Chair, Behavioral Sub-Committee
Scientific Review Committee

Skindex29

DERMATOLOGY SURVEY

This survey concerns the skin condition which has bothered you the most during the past four weeks.

Skindex29

These questions concern your feelings over the past 4 weeks about **the skin condition that has bothered you the most.** Check the answer that comes closest to the way you have been feeling.

HOW OFTEN DURING THE PAST FOUR WEEKS DO THESE STATEMENTS DESCRIBE YOU?	NEVER	RARELY	SOMETIMES	OFTEN	ALL THE TIME
1. My skin hurts	☐1	☐2	☐3	☐4	☐5
2. My skin condition affects how well I sleep	☐1	☐2	☐3	☐4	☐5
3. I worry that my skin condition may be serious	☐1	☐2	☐3	☐4	☐5
4. My skin condition makes it hard to work or do hobbies	☐1	☐2	☐3	☐4	☐5
5. My skin condition affects my social life	☐1	☐2	☐3	☐4	☐5
6. My skin condition makes me feel depressed	☐1	☐2	☐3	☐4	☐5
7. My skin condition burns or stings	☐1	☐2	☐3	☐4	☐5
8. I tend to stay at home because of my skin condition	☐1	☐2	☐3	☐4	☐5
9. I worry about getting scars from my skin condition	☐1	☐2	☐3	☐4	☐5
10. My skin itches	☐1	☐2	☐3	☐4	☐5
11. My skin condition affects how close I can be with those I love	☐1	☐2	☐3	☐4	☐5
12. I am ashamed of my skin condition	☐1	☐2	☐3	☐4	☐5
13. I worry that my skin condition may get worse	☐1	☑2	☐3	☐4	☐5
14. I tend to do things by myself because of my skin condition	☐1	☐2	☐3	☐4	☐5
15. I am angry about my skin condition	☐1	☐2	☐3	☐4	☐5
16. Water bothers my skin condition (bathing, washing hands)	☐1	☐2	☐3	☐4	☐5
17. My skin condition makes showing affection difficult	☐1	☐2	☐3	☐4	☐5
18. I worry about side-effects from skin medications / treatments	☐1	☐2	☐3	☐4	☐5
19. My skin is irritated	☐1	☐2	☐3	☐4	☐5
20. My skin condition affects my interactions with others	☐1	☐2	☐3	☐4	☐5

Please turn to next page

Skindex29

These questions concern your feelings over the past 4 week about **the skin condition that has bothered you the most**. Check the answer that comes closest to the way you have been feeling.

HOW OFTEN DURING THE PAST 4 WEEK DO THESE STATEMENTS DESCRIBE YOU?	NEVER	RARELY	SOMETIMES	OFTEN	ALL THE TIME
21. I am embarrassed by my skin condition	☐1	☐2	☐3	☐4	☐5
22. My skin condition is a problem for the people I love	☐1	☐2	☐3	☐4	☐5
23. I am frustrated by my skin condition	☐1	☐2	☐3	☐4	☐5
24. My skin is sensitive	☐1	☐2	☐3	☐4	☐5
25. My skin condition affects my desire to be with people	☐1	☐2	☐3	☐4	☐5
26. I am humiliated by my skin condition	☐1	☐2	☐3	☐4	☐5
27. My skin condition bleeds	☐1	☐2	☐3	☐4	☐5
28. I am annoyed by my skin condition	☐1	☐2	☐3	☐4	☐5
29. My skin condition interferes with my sex life	☐1	☐2	☐3	☐4	☐5
30. My skin condition makes me tired	☐1	☐2	☐3	☐4	☐5

EORTC QLQ-C30 (version 3)

We are interested in some things about you and your health. Please answer all of the questions yourself by circling the number that best applies to you. There are no "right" or "wrong" answers. The information that you provide will remain strictly confidential.

Please fill in your initials: |_|_|_|

Your birthdate (Day, Month, Year): |_|_| |_|_| |_|_|_|_|

Today's date (Day, Month, Year): 31 |_|_| |_|_| |_|_|_|_|

	Not at All	A Little	Quite a Bit	Very Much
1. Do you have any trouble doing strenuous activities, like carrying a heavy shopping bag or a suitcase?	1	2	3	4
2. Do you have any trouble taking a long walk?	1	2	3	4
3. Do you have any trouble taking a short walk outside of the house?	1	2	3	4
4. Do you need to stay in bed or a chair during the day?	1	2	3	4
5. Do you need help with eating, dressing, washing yourself or using the toilet?	1	2	3	4

During the past week:	Not at All	A Little	Quite a Bit	Very Much
6. Were you limited in doing either your work or other daily activities?	1	2	3	4
7. Were you limited in pursuing your hobbies or other leisure time activities?	1	2	3	4
8. Were you short of breath?	1	2	3	4
9. Have you had pain?	1	2	3	4
10. Did you need to rest?	1	2	3	4
11. Have you had trouble sleeping?	1	2	3	4
12. Have you felt weak?	1	2	3	4
13. Have you lacked appetite?	1	2	3	4
14. Have you felt nauseated?	1	2	3	4
15. Have you vomited?	1	2	3	4
16. Have you been constipated?	1	2	3	4

Please go on to the next page

During the past week:	Not at All	A Little	Quite a Bit	Very Much
17. Have you had diarrhea?	1	2	3	4
18. Were you tired?	1	2	3	4
19. Did pain interfere with your daily activities?	1	2	3	4
20. Have you had difficulty in concentrating on things, like reading a newspaper or watching television?	1	2	3	4
21. Did you feel tense?	1	2	3	4
22. Did you worry?	1	2	3	4
23. Did you feel irritable?	1	2	3	4
24. Did you feel depressed?	1	2	3	4
25. Have you had difficulty remembering things?	1	2	3	4
26. Has your physical condition or medical treatment interfered with your family life?	1	2	3	4
27. Has your physical condition or medical treatment interfered with your social activities?	1	2	3	4
28. Has your physical condition or medical treatment caused you financial difficulties?	1	2	3	4

For the following questions please circle the number between 1 and 7 that best applies to you

29. How would you rate your overall health during the past week?

1	2	3	4	5	6	7
Very poor						Excellent

30. How would you rate your overall quality of life during the past week?

1	2	3	4	5	6	7
Very poor						Excellent

Date: _____
Patient ID: _____

CES-D SCALE

Circle the number for each statement which best describes how often you felt or behaved this way – DURING THE PAST WEEK.

DURING THE PAST WEEK:	Rarely or None of the Time (Less than 1 day)	Some or a Little of the Time (1-2 days)	Occasionally or a Moderate Amount of Time (3-4 days)	Most or All of the Time (5-7 days)
1. I was bothered by things that usually don't bother me.	0	1	2	3
2. I did not feel like eating; my appetite was poor.	0	1	2	3
3. I felt that I could not shake off the blues even with help from my family or friends.	0	1	2	3
4. I felt that I was just as good as other people.	0	1	2	3
5. I had trouble keeping my mind on what I was doing.	0	1	2	3
6. I felt depressed.	0	1	2	3
7. I felt that everything I did was an effort.	0	1	2	3
I felt hopeful about the future.	0	1	2	3
9. I thought my life had been a failure.	0	1	2	3
10. I felt fearful.	0	1	2	3
11. My sleep was restless.	0	1	2	3
12. I was happy.	0	1	2	3
13. I talked less than usual.	0	1	2	3
14. I felt lonely.	0	1	2	3
15. People were unfriendly.	0	1	2	3
16. I enjoyed life.	0	1	2	3
17. I had crying spells.	0	1	2	3
18. I felt sad.	0	1	2	3
19. I felt that people disliked me.	0	1	2	3
20. I could not get "going".	0	1	2	3

SELF-EVALUATION QUESTIONNAIRE
STAI Form Y-1

Please provide the following information:

Name_____ Date_____ S_____

Age_____ Gender (*Circle*) **M** **F** T_____

DIRECTIONS:

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel *right* now, that is, *at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

	NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1. I feel calm	1	2	3	4
2. I feel secure	1	2	3	4
3. I am tense	1	2	3	4
4. I feel strained	1	2	3	4
5. I feel at ease	1	2	3	4
6. I feel upset	1	2	3	4
7. I am presently worrying over possible misfortunes	1	2	3	4
8. I feel satisfied	1	2	3	4
9. I feel frightened	1	2	3	4
10. I feel comfortable	1	2	3	4
11. I feel self-confident	1	2	3	4
12. I feel nervous	1	2	3	4
13. I am jittery	1	2	3	4
14. I feel indecisive	1	2	3	4
15. I am relaxed	1	2	3	4
16. I feel content	1	2	3	4
17. I am worried	1	2	3	4
18. I feel confused	1	2	3	4
19. I feel steady	1	2	3	4
20. I feel pleasant	1	2	3	4

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FACIT-Sp (Version 4)

Below is a list of statements that other people with your illness have said are important. **Please circle or mark one number per line to indicate your response as it applies to the past 7 days.**

	PHYSICAL WELL-BEING	Not at all	A little bit	Some-what	Quite a bit	Very much
GP1	I have a lack of energy	0	1	2	3	4
GP2	I have nausea	0	1	2	3	4
GP3	Because of my physical condition, I have trouble meeting the needs of my family	0	1	2	3	4
GP4	I have pain	0	1	2	3	4
GP5	I am bothered by side effects of treatment	0	1	2	3	4
GP6	I feel ill	0	1	2	3	4
GP7	I am forced to spend time in bed	0	1	2	3	4

	SOCIAL/FAMILY WELL-BEING	Not at all	A little bit	Some-what	Quite a bit	Very much
GS1	I feel close to my friends	0	1	2	3	4
GS2	I get emotional support from my family	0	1	2	3	4
GS3	I get support from my friends	0	1	2	3	4
GS4	My family has accepted my illness	0	1	2	3	4
GS5	I am satisfied with family communication about my illness	0	1	2	3	4
GS6	I feel close to my partner (or the person who is my main support)	0	1	2	3	4
Q1	*Regardless of your current level of sexual activity, please answer the following question. If you prefer not to answer it, please mark this box* ☐ *and go to the next section.*					
GS7	I am satisfied with my sex life	0	1	2	3	4

FACIT-Sp (Version 4)

Please circle or mark one number per line to indicate your response as it applies to the past 7 days.

	EMOTIONAL WELL-BEING	Not at all	A little bit	Some-what	Quite a bit	Very much
GE1	I feel sad	0	1	2	3	4
GE2	I am satisfied with how I am coping with my illness	0	1	2	3	4
GE3	I am losing hope in the fight against my illness	0	1	2	3	4
GE4	I feel nervous	0	1	2	3	4
GE5	I worry about dying	0	1	2	3	4
GE6	I worry that my condition will get worse	0	1	2	3	4

	FUNCTIONAL WELL-BEING	Not at all	A little bit	Some-what	Quite a bit	Very much
GF1	I am able to work (include work at home)	0	1	2	3	4
GF2	My work (include work at home) is fulfilling	0	1	2	3	4
GF3	I am able to enjoy life	0	1	2	3	4
GF4	I have accepted my illness	0	1	2	3	4
GF5	I am sleeping well	0	1	2	3	4
GF6	I am enjoying the things I usually do for fun	0	1	2	3	4
GF7	I am content with the quality of my life right now	0	1	2	3	4

FACIT-Sp (Version 4)

Please circle or mark one number per line to indicate your response as it applies to the past 7 days.

	ADDITIONAL CONCERNS	Not at all	A little bit	Some-what	Quite a bit	Very much
Sp1	I feel peaceful	0	1	2	3	4
Sp2	I have a reason for living	0	1	2	3	4
Sp3	My life has been productive	0	1	2	3	4
Sp4	I have trouble feeling peace of mind	0	1	2	3	4
Sp5	I feel a sense of purpose in my life	0	1	2	3	4
Sp6	I am able to reach down deep into myself for comfort	0	1	2	3	4
Sp7	I feel a sense of harmony within myself	0	1	2	3	4
Sp8	My life lacks meaning and purpose	0	1	2	3	4
Sp9	I find comfort in my faith or spiritual beliefs	0	1	2	3	4
Sp10	I find strength in my faith or spiritual beliefs	0	1	2	3	4
Sp11	My illness has strengthened my faith or spiritual beliefs	0	1	2	3	4
Sp12	I know that whatever happens with my illness, things will be okay	0	1	2	3	4

CANCER RELATED FATIGUE DISTRESS SCALE
(CRFDS)

Sandra Holley, PhD, ARNP

INSTRUCTIONS: Below and on the next 3 pages are a list of problems people sometimes have because of their cancer related fatigue. Please read each one carefully. Please circle the number that best describes HOW MUCH THAT PROBLEM HAS DISTRESSED OR BOTHERED YOU DURING THE PAST 7 DAYS, INCLUDING TODAY. Circle only one number for each problem and do not skip any items. If you change your mind, erase your first mark carefully. Read the example before beginning, and if you have any questions please ask them now.

Please complete all 20 items and the 3 additional items on the last page.

The fatigue or tiredness I am having causes me distress because it:

1. makes it difficult for me to concentrate.

How much distress does this cause you?

0 1 2 3 4 5 6 7 8 9 10

No distress Severe distress

2. makes me feel that I must accept more help from others.

How much distress does this cause you?

0 1 2 3 4 5 6 7 8 9 10

No distress Severe distress

3. makes me feel that I am more than just tired.

How much distress does this cause you?

0 1 2 3 4 5 6 7 8 9 10

No distress Severe distress

4. makes me feel frustrated when I can't do what I used to do.

How much distress does this cause you?

0 1 2 3 4 5 6 7 8 9 10

No distress Severe distress

The fatigue or tiredness I am having causes me distress because it:

12. makes me feel tired more quickly than typical fatigue.

How much distress does this cause you?

0 1 2 3 4 5 6 7 8 9 10

No distress Severe distress

13. makes me feel uncertain about my future.

How much distress does this cause you?

0 1 2 3 4 5 6 7 8 9 10

No distress Severe distress

14. makes me feel totally exhausted.

How much distress does this cause you?

0 1 2 3 4 5 6 7 8 9 10

No distress Severe distress

15. makes me feel like I am a different person.

How much distress does this cause you?

0 1 2 3 4 5 6 7 8 9 10

No distress Severe distress

16. makes me stay at home more.

How much distress does this cause you?

0 1 2 3 4 5 6 7 8 9 10

No distress Severe distress

17. makes me feel a loss of control over my life.

How much distress does this cause you?

0 1 2 3 4 5 6 7 8 9 10

No distress Severe distress

18. makes it difficult for me to remember things.

How much distress does this cause you?

0 1 2 3 4 5 6 7 8 9 10

No distress Severe distress

The fatigue or tiredness I am having causes me distress because it:

19. makes me feel as if I have no energy.

How much distress does this cause you?

0	1	2	3	4	5	6	7	8	9	10
No distress										Severe distress

20. makes me feel like I am losing interest in things.

How much distress does this cause you?

0	1	2	3	4	5	6	7	8	9	10
No distress										Severe distress

Please circle the number that most describes your fatigue.

	No fatigue										Severe fatigue
Fatigue level now	0	1	2	3	4	5	6	7	8	9	10
Worst fatigue level this past 7 days	0	1	2	3	4	5	6	7	8	9	10
Usual fatigue level for the past 7 days	0	1	2	3	4	5	6	7	8	9	10

Please circle the one number below that best describes your situation now

KARNOFSKY PERFORMANCE SCALE (Wingard et.al., 1991)

100	normal; no complaints; no evidence of disease
90	able to carry on normal activity; minor signs of symptoms of disease
80	normal activity with effort; some sign or symptoms of disease
70	cares for self; unable to carry on normal activity or do active work
60	requires occasional assistance, but is able to care for most personal needs
50	requires considerable assistance and frequent medical care
40	disabled; requires special care and assistance

DERMATOLOGY SURVEY

This survey concerns the skin condition which has bothered you the most during the past week.

Skindex16

THESE QUESTIONS CONCERN THE SKIN CONDITION WHICH HAS BOTHERED YOU THE MOST DURING THE PAST WEEK

During the past week, how often have you been bothered by:	Never Bothered ↓						Always Bothered ↓
1. Your skin condition **itching**	☐0	☐1	☐2	☐3	☐4	☐5	☐6
2. Your skin condition **burning** or **stinging**	☐0	☐1	☐2	☐3	☐4	☐5	☐6
3. Your skin condition **hurting**	☐0	☐1	☐2	☐3	☐4	☐5	☐6
4. Your skin condition **being irritated**	☐0	☐1	☐2	☐3	☐4	☐5	☐6
5. The **persistence / reoccurrence** of your skin condition	☐0	☐1	☐2	☐3	☐4	☐5	☐6
6. **Worry** about your skin condition (For example: that it will spread, get worse, scar, be unpredictable, etc)	☐0	☐1	☐2	☐3	☐4	☐5	☐6
7. The **appearance** of your skin condition	☐0	☐1	☐2	☐3	☐4	☐5	☐6
8. **Frustration** about your skin condition	☐0	☐1	☐2	☐3	☐4	☐5	☐6
9. **Embarrassment** about your skin condition	☐0	☐1	☐2	☐3	☐4	☐5	☐6
10. **Being annoyed** about your skin condition	☐0	☐1	☐2	☐3	☐4	☐5	☐6
11. **Feeling depressed** about your skin condition	☐0	☐1	☐2	☐3	☐4	☐5	☐6
12. The effects of your skin condition on your **interactions with others** (For example: interactions with family, friends, close relationships, etc)	☐0	☐1	☐2	☐3	☐4	☐5	☐6
13. The effects of your skin condition on your **desire to be with people**	☐0	☐1	☐2	☐3	☐4	☐5	☐6
14. Your skin condition making it hard to **show affection**	☐0	☐1	☐2	☐3	☐4	☐5	☐6
15. The effects of your skin condition on your **daily activities**	☐0	☐1	☐2	☐3	☐4	☐5	☐6
16. Your skin condition making it hard to **work or do what you enjoy**	☐0	☐1	☐2	☐3	☐4	☐5	☐6

Have you answered every item? Yes ☐ No ☐